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MR. STANLEY BALDWIN has stated in the House of Commons that the question of the suspension of the issue of the *Kew Bulletin* had been considered by the Select Committee on Publications and Debates' Reports, and that it was decided to recommend that the *Bulletin* should be continued, but with due regard to economy. Certain classes of information, though doubtless of scientific interest, can, it is thought, be postponed without detriment to the welfare of the state.

UNIVERSITY AND EDUCATIONAL NEWS

ACCORDING to the *Experiment Station Record* appropriations made by the state legislature for the South Dakota College and Station include \$80,000 for an armory, \$100,000 for the completion of Agricultural Hall, \$10,000 for a health laboratory, \$10,000 for the manufacture of hog cholera serum, \$20,000 for a fireproof stock judging pavilion, \$3,000 for a poultry department, \$10,000 for the purchase of pure bred live stock, and \$5,000 for feeding experiments with live stock. This is the first appropriation made by the state for experimental work.

PROFESSOR E. V. MCCOLLUM has resigned his position as professor of agricultural chemistry at the University of Wisconsin, to take charge of the department of chemistry of the new school of hygiene and public health, which the Rockefeller Foundation has established in connection with the medical school of the Johns Hopkins University.

PROFESSOR FRANK C. BECHT, assistant professor of pharmacology in the University of Chicago, has been appointed professor and head of the department of pharmacology in Northwestern University Medical School, succeeding Professor Hugh McGuigan, who has become professor of pharmacology in the University of Illinois.

DR. A. E. LAMBERT has been appointed professor of histology and embryology in the college of medicine of the University of Vermont. Dr. M. W. Hunter, instructor in medicine, has resigned and Dr. Fred E. Clark, assistant pro-

fessor of pathology, has received a year's leave of absence.

PROFESSOR H. HALPERIN, of Vanderbilt University, has been appointed assistant professor of mathematics at the University of Arkansas.

DR. PERCY KENDALL HOLMES, of the University of Cincinnati, has been appointed director of physical education in Ohio Wesleyan University.

MR. G. GERALD STONEY has been appointed professor of mechanical engineering in the Manchester School of Technology.

M. LUCIEN POINCARÉ, director of higher education in France, has been appointed vice-rector of the University of Paris, in succession to M. Liard.

M. MOUREU, member of the French Institute, professor in the school of pharmacy and director of the editorial board of the *Revue Scientifique*, has been appointed professor of organic chemistry in the Collège de France.

DISCUSSION AND CORRESPONDENCE

THE COST OF ROAST PIG

CHARLES LAMB, in his "Dissertation on Roast Pig" relates that, according to an ancient manuscript, the hut of a Chinese swineherd taking fire, a litter of newly farrowed pigs perished in the conflagration. Seeking to find if life remained in any of them, the swineherd burned his fingers on the hot body of a pig. To alleviate the pain he naturally put his fingers into his mouth and so discovered the delicious flavor of roast pig. The taste spread rapidly and shortly all China was ablaze with burning pig pens sacrificed for the sake of producing the new delicacy.

In the food crisis with which the world is apparently confronted, roast pig may stand for the supply of animal products in general, and our methods for producing them hitherto have not been altogether unlike that for roasting pigs attributed to the Chinese. At this juncture, it seems pertinent to inquire whether our practises in this respect do not need to be modified so as to contribute more effectively to the feeding of the nations.

Roast pig, to those who like it, is not only a delicacy but a valuable article of diet, but nevertheless, as the Chinese presumably came to realize, it is possible to pay too high a price for it, and while a proposal to restrict rather than to promote meat production in the present crisis may appear both irrational and unpatriotic it may nevertheless be in the interest of true food economy.

This is because of one cardinal fact which the advocates of the multiplication of farm live stock, the prohibition of the slaughter of young animals, etc., overlook. That fact is that not only must the meat or milk producing animal be fed (and even this appears to be forgotten at times) but that the conversion of feed into animal products is a process of relatively low efficiency.

Man needs food primarily as fuel to supply the energy for his activities and secondarily to furnish the repair material (protein) for the bodily machinery. An active adult requires daily some 4,000 calories of energy, the amount varying more or less according to the amount of physical work done. He can get this energy from either vegetable or animal products. He may make his wheat or corn into bread and use that bread as body fuel, or he may feed them to animals and consume the resulting meat or milk. The latter are excellent body fuels and are desirable ingredients of the dietary but their production from grains is a very wasteful process. It may be roughly estimated that about 24 per cent. of the energy of grain is recovered for human consumption in pork, about 18 per cent. in milk and only about 3.5 per cent. in beef and mutton. In other words, the farmer who feeds bread grains to his stock is unconsciously imitating the Chinese method and is burning up 75 to 97 per cent. of them in order to produce for us a small residue of roast pig, and so is diminishing the total stock of human food.

Now most of us like roast pig and its production in this way has doubtless been economically justifiable in years past when our food supply was vastly in excess of our needs. To-day the case is different. No longer can

we continue to take the children's bread and cast it to the brutes. If our meat supply is to be maintained or increased it must be in some other way. All the edible products which the farmer's acres can yield are needed for human consumption. The task of the stock feeder must be to utilize through his skill and knowledge the inedible products of the farm and factory such as hay, corn stalks, straw, bran, brewers' and distillers' grains, gluten feed, and the like, and to make at least a fraction of them available for man's use. In so doing he will be really adding to the food supply and will be rendering a great public service. Rather than seek to stimulate live stock husbandry the ideal should be to adjust it to the limits set by the available supply of forage crops and by-product feeding stuffs while, on the other hand, utilizing these to the greatest practicable extent, because in this way we save some of what would otherwise be a total loss. In particular the recommendation to raise more hogs seems to call for some qualification. It is indeed true, as several have pointed out, that the hog can make more pounds of edible meat from a given amount of concentrated feed than any other class of live stock. The point is that with the present demand for bread grains we can not afford the cost of the conversion. So far as hogs can be raised on forage and by-products the recommendation is sound, and this animal can play an important part in utilizing domestic and other wastes, but the hog is the great competitor of man for the higher grades of food and in swine husbandry as ordinarily conducted we are in danger of paying too much for our roast pig. Cattle and sheep, on the other hand, although less efficient as converters, can utilize products which man can not use and save some of their potential value as human food. From this point of view, as well as on account of the importance of milk to infants and invalids, the high economy of food production by the dairy cow deserves careful consideration, although of course the large labor requirement is a counter-balancing factor.

At any rate, it is clear that at the present time enthusiastic but ill considered "boom-

ing" of live stock production may do more harm than good. If it is desirable to restrict or prohibit the production of alcohol from grain or potatoes on the ground that it involves a waste of food value, the same reason calls for restriction of the burning-up of these materials to produce roast pig. This means, of course, a limited meat supply. To some of us this may seem a hardship. Meat, however, is by no means the essential that we have been wont to suppose and partial deprivation of it is not inconsistent with high bodily efficiency. Certainly no patriotic citizen would wish to insist on his customary allowance of roast pig at the cost of the food supply of his brothers in the trenches.

H. P. ARMSBY

STATE COLLEGE, PA.,
June, 1917

A NEW CONTRIBUTION TO AMERICAN GEOLOGY

UNDER the heading "Work going on at Kilauea Volcano" there was published in *SCIENCE* of September 12, 1913, an account from Hawaii by Mr. Geo. Carroll Curtis, of the field work, circuit and kite camera surveys being conducted in the great active crater, in connection with the construction of a naturalistic model for the geological department of Harvard University.

After four years of continuous effort this work has been completed and installed in the university museum. While the size and time required distinguish it, the principles it involves of faithful and expressive reproduction of the earth surface is of special significance, as it seems to mark a distinct progress in the complex subject of representing our earth in true relief and character. A single glance at the great model is convincing, for in looking upon this vast collection of accurate data, one receives the impression that he is viewing the outdoor field itself! The model looks like the actual ground because it has been made like it, an immense amount of information never before collected having been incorporated from the special surveys. This is a signal triumph in the truthful interpretation of a splendid type of geological structure such as Kilauea

presents. It clearly indicates the novel and broad interest which awaits the earth sciences in the reproduction of their museum natural history specimens through the medium of serious work in land relief.

The longest time previously given to any work we have had of this nature, was two years, in the naturalistic reproduction of the coral island Bora Bora,¹ under the instigation of Alexander Agassiz. It was made to illustrate the typical "high coral island." This work, completed in 1907, was the first in the land where the necessary photographic survey and special field work were employed to truthfully reproduce a land form type, and marked the introduction of the naturalistic or landscape model in American exhibition. The character of the work was illustrated by the photographs made from it, bearing a surprising resemblance to those taken on the actual ground, a thing previously unlooked for in our land reliefs. This unique contribution to the progress of earth science is still considered the most complete exposition of a coral island known, and as the pioneer in naturalistic land relief (the completest expression which science and art can give of the earth's surface) will always remain a most significant piece of work.

The Kilauea model represents the progress of the intervening decade, in the new and developing art of the accurate reproduction of the surface of the planet, and is the culmination of the unique experience which has come through a training in both geology and in art, which Mr. Curtis has given to this profound though much misrepresented work of earth relief. Against precedent he has attempted to make a profession rather than a business of a work which calls for treatment adequate to the dignity of natural science. Valuable as may be the individual models to which Curtis has given so much time and study, it is in the establishment of a standard more in keeping with that called for by the natural sciences and by the meaning and interest of the face of our earth, that his most significant achieve-

¹ Darwin, "Structure and Distribution of Coral Reefs," p. 4.